REMARKS

Based on the above amendment and the following remarks, applicants respectfully submit that all the pending claims are in condition for allowance.

Status of the Claims

Claims 1-3 were pending. Claim 1 has been amended. Claim 4-21 have been added. Claims 1-21 are therefore pending.

Rejections under 35 USC § 102

Claims 1-3 stand rejected under 35 USC §102(e) as being anticipated by U.S. Patent No. 6,339,613 ("Terry"). "To anticipate a claim, the reference must teach every element of the claim." MPEP § 2131. Applicants traverse this rejection because Terry fails to teach (or even suggest) every element of the claims.

For example, claim 1 as amended recites "the power spectral density of the transmitted uplink signals is proportional to ... [and] substantially unequal to the power spectral density of the transmitted downlink signals." The examiner cites col. 6, ll. 1-21, and col. 12, ll. 34-40, of Terry as teaching PSD proportionality between uplink and downlink signals. The first of these cites actually describes the adjustment of transmit signals to avoid near-end crosstalk ("NEXT"), which does not provide any particular relationship between the uplink and downlink PSDs, much less a proportionality relationship. The second of these cites simply mentions a ratio of upstream and downstream transmission rates. Because such a ratio is independent of any relationship between the uplink and downlink PSDs, no teaching or suggestion of PSD proportionality is stated or implied here.

Applicants note that in passing, Terry does mention symmetric communications systems having the same PSD for signals transmitted in opposite directions. Col. 3, ll. 11-18. Nevertheless, Terry fails to teach or suggest that uplink and downlink PSDs could be proportional and unequal to each other as required by amended claim 1. To the contrary, Terry's

teachings are limited to symmetric systems having equal uplink and downlink PSDs, and to asymmetric systems having uplink and downlink signals sent in different frequency bands. Col. 5, ll. 17-27. For at least this reason, applicants maintain that claim 1 is allowable over the Terry reference. Newly added independent claims 4 and 13 recite a similar limitation. For at least this reason, applicants submit that independent claims 4 and 13, along with their dependent claims 5 and 14, are similarly allowable.

Unamended claim 2 recites in part:

at frequencies below a selected frequency M_{E2F}, the power spectral density of the transmitted uplink signals is proportional to the power spectral density of the transmitted downlink signals by a positive scale factor, ...

at frequencies above M_{E2F}, the power spectral density of the uplink signals are limited to one or more uplink frequency bands and the downlink signals are limited to one or more downlink frequency bands that are disjoint from the uplink frequency bands, and ... the total bandwidth of the uplink frequency bands is proportional to the total bandwidth of the downlink frequency bands by the same positive scale factor

The examiner cites col. 6, ll. 1-54, col. 8, ll. 49-67, and col. 12, ll. 34-40, of Terry as teaching these limitations. In fact, Terry teaches in this first cite that the transmitted (downlink) signals from modem 12 are limited to a pass band of 150 kHz to 1 MHz. Col. 6, ll. 28-35. The transmitted (uplink) signals from modem 14 are limited to a pass band of 50 to 100 kHz. Col. 6, ll. 42-48. Thus, there is no selected frequency below which the PSD of the uplink and downlink signals are related by any scale factor, much less by a scale factor that equals a ratio of bandwidths above the selected frequency. In the second cite, Terry simply describes a DSP implementation of a modem that provides for extensive control over the transmitted PSD. Absent from this description is any suggestion of a selected frequency below which the PSD of the uplink and downlink signals are related by any scale factor, and above which the ratio of bandwidths equals the same scale factor. In the third cite, Terry mentions a ratio between upstream and downstream transmission rates. This ratio is independent of any relationship between the uplink and downlink PSDs, and hence it provides no teaching or suggestion of the quoted claim limitations. Indeed, applicants cannot find any teaching or suggestion of such

limitations anywhere in Terry. For at least this reason, applicants maintain that claim 2 is allowable over the Terry reference. Newly added independent claims 6 and 15 recite similar limitations. For at least this reason, applicants submit that claims 6 and 15, along with their dependent claims 7-8 and 16-17, are similarly allowable.

Unamended claim 3 recites in part "predetermined uplink and downlink average signal powers". The examiner cites col. 11, line 16 - col. 12, line 15, and col. 3, ll. 14-21, as teaching the elements that contain this limitation. In the first cite, Terry describes a method of adjusting PSD parameters, but nowhere teaches or suggests that those PSD parameters are based in any fashion upon predetermined uplink and downlink average signal powers. In the second cite, Terry notes that "the PSDs of signals in the two opposite directions of transmission are substantially different". Col. 3, ll. 19-21. While it is true that average signal power is related to power spectral density, the relationship is such that the power spectral densities can be wildly different while the average signal powers remain the same. In any event, Terry provides no teaching or suggestion that the average signal powers are predetermined. As a consequence, Terry fails to provide any teaching or suggestion of using such predetermined average signal powers as a constraint when maximizing uplink and downlink capacity. For at least these reasons, applicants maintain that claim 3 is allowable over the Terry reference.

Newly added independent claims 9 and 18 recite in part "maximiz[ing] a sum of uplink and downlink capacities subject to a predetermined average uplink power and a predetermined average downlink power, wherein the predetermined average uplink and downlink powers are unequal". As argued previously, Terry provides no teaching or suggestion of predetermined average signal powers, let alone maximizing channel capacity subject to constraining such average signal powers. For at least this reason, applicants submit that independent claims 9 and 18, along with their dependent claims 10-12 and 19-21, are also allowable over Terry.

Conclusion

In the course of the foregoing discussions, applicants may have at times referred to claim limitations in shorthand fashion, or may have focused on a particular claim element. This discussion should not be interpreted to mean that the other limitations can be ignored or dismissed. The claims must be viewed as a whole, and each limitation of the claims must be considered when determining the patentability of the claims. Moreover, it should be understood that there may be other distinctions between the claims and the prior art which have yet to be raised, but which may be raised in the future.

In view of the foregoing amendments and remarks, Applicants submit that all pending claims are now in condition for allowance, and an early notice to that effect is earnestly solicited. If any fees are inadvertently omitted or if any additional fees are required or have been overpaid, please appropriately charge or credit those fees to Conley Rose, P.C. Deposit Account Number 03-2769/1789-01910/.

Respectfully submitted/
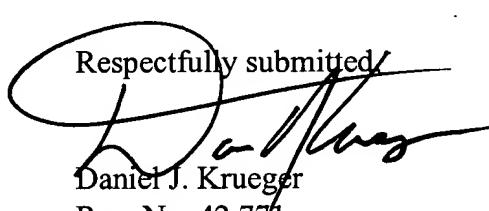
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